

WO 2005/044108 A1

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date  
19 May 2005 (19.05.2005)

PCT

(10) International Publication Number  
**WO 2005/044108 A1**

(51) International Patent Classification<sup>7</sup>:  
8/06, G10K 11/34

**A61B 8/00,**

(74) Common Representative: KONINKLIJKE PHILIPS ELECTRONICS, N.V.; c/o W. Brinton Yorks, Jr., P.O. Box 3003, Bothell, Washington 98041-3003 (US).

(21) International Application Number:

PCT/IB2004/003570

(22) International Filing Date:

1 November 2004 (01.11.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/518,277 7 November 2003 (07.11.2003) US

(71) Applicant (*for all designated States except US*): KONINKLIJKE PHILIPS ELECTRONICS, N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventors; and

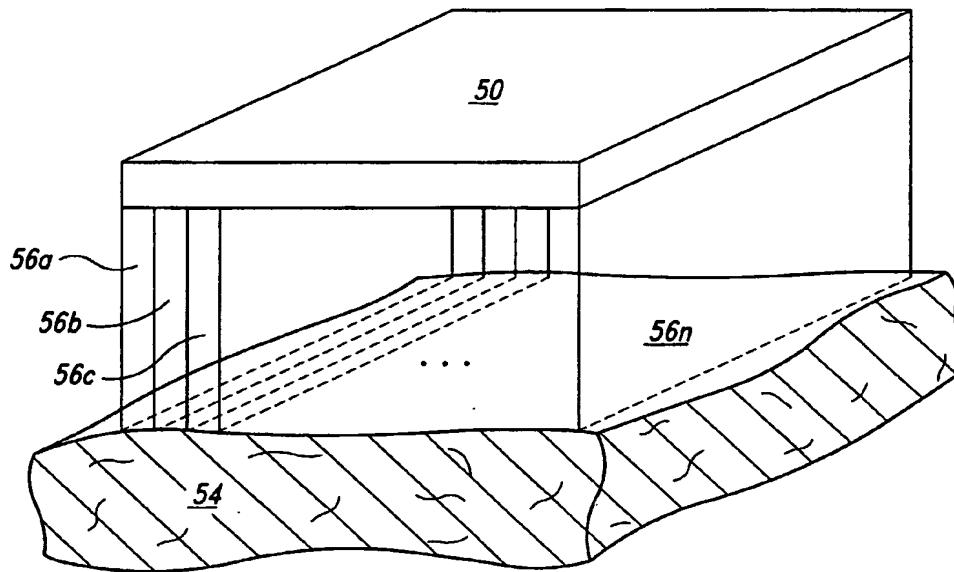
(75) Inventors/Applicants (*for US only*): AVERKIOU, Michalakis [CY/US]; P.O. Box 3003, Bothell, Washington 98041-3003 (US). RAFTER, Patrick [US/US]; P.O. Box 3003, Bothell, Washington 98041-3003 (US).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR ULTRASOUND PERFUSION IMAGING



(57) Abstract: An ultrasound imaging system transmits a broad beam of ultrasound into tissues that are perfused with blood containing microbubbles. The ultrasound has an intensity that is sufficient to destroy the microbubbles in the tissues. A plurality of ultrasound imaging beams are then transmitted into the tissues over a sufficient period to allow the tissues to re-perfuse, and reflections from the transmitted imaging beams are processed to provide a perfusion image. The transmitted microbubble-destroying ultrasound may be in the form of a single beam or a plurality of beams that insonify a substantially larger area than the area insonified by the transmitted imaging beams. As a result, the microbubbles are all destroyed at substantially the same time, and the imaging ultrasound is transmitted only into regions of the tissues from which ultrasound reflections will be received.

**Declaration under Rule 4.17:**

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ,*

*BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

**Published:**

— *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*